# 图形点阵液晶显示模块使用手册

# CM19264-1SLYB

## 一．　概述

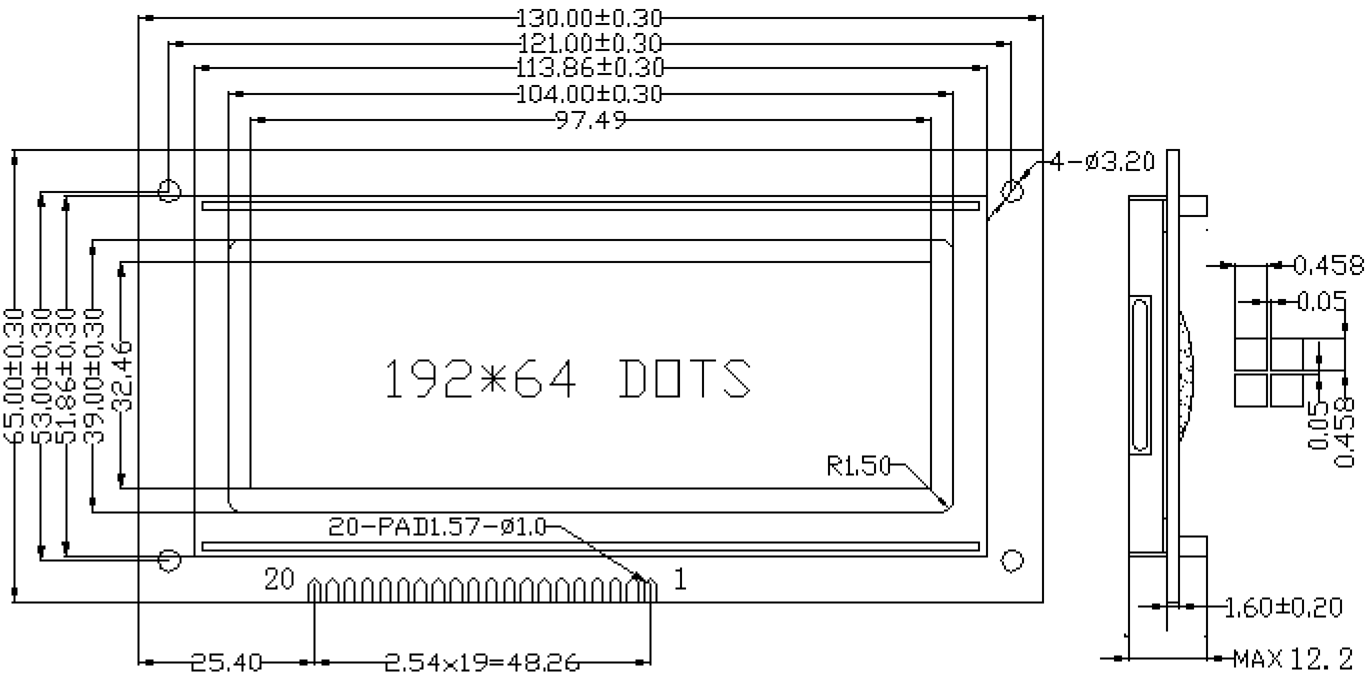
CM19264-1 是一种图形点阵液晶显示器,它主要由行驱动器/列驱动器及格 192×64 全点阵液晶显示器组成。可完成图形显示，也可以显示 12×4 个(16×16 点阵)汉字。

主要技术参数和性能：

1.电源：VDD：+5V；
2.显示内容：192(列)×64(行)点
3.全屏幕点阵
4.七种指令
5.与 CPU 接口采用 8 位数据总线并行输入输出和 8 条控制线
6.占空比 1/64
7.工作温度：-10℃∽+55℃，存储温度：-20℃∽+70℃
8.显示模式：黄绿膜、灰膜、蓝膜、黑白膜
9.背光特性：LED 背光（黄绿色、蓝色、白色、红色）
10.模块封装方式：COB
11.视角方向：6:00
12.功耗：模块自带负压

## 二．　外形尺寸图

1．外形尺寸图

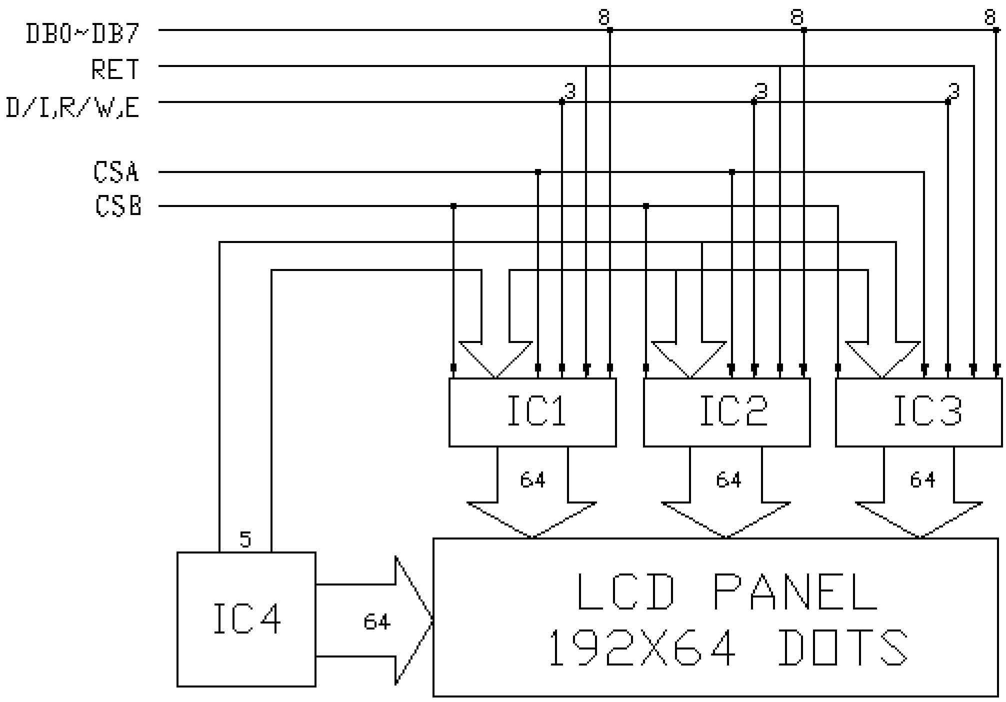



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2. 外形尺寸

| ITEM | NOMINAL DIMEN | UNIT |
|---|---|---|
| 模块体积 | 130×65×9.5/12.2 | mm |
| 视域 | 104×39 | mm |
| 行列点阵数 | 192×64 | dots |
| 点距离 | 0.05×0.05 | mm |
| 点大小 | 0.458×0.458 | mm |

## 三．模块主要硬件构成说明 （结构框图）




IC4 为行驱动器。IC1，IC2，IC3 为列驱动器。IC1，IC2，IC3，IC4 含有以下主要功能器件。了解如下器件有利于对 LCD 模块之编程。

**1．指令寄存器(IR)**

IR 是用于寄存指令码，与数据寄存器数据相对应。当 D/I=0 时，在 E 信号下降沿的作用下，指令码写入 IR。

**2．数据寄存器(DR)**

DR 是用于寄存数据的，与指令寄存器寄存指令相对应。当 D/I=1 时，在下降沿作用下，图形显示数据写入 DR，或在 E 信号高电平作用下由 DR 读到 DB7∽DB0 数据总线。DR 和 DDRAM 之间的数据传输是模块内部自动执行的。

**3．忙标志：BF**

BF 标志提供内部工作情况。BF=1 表示模块在内部操作，此时模块不接受外部指令和数据。BF=0 时，模块为准备状态，随时可接受外部指令和数据。

利用 STATUS READ 指令，可以将 BF 读到 DB7 总线，从检验模块之工作状态。

**4．显示控制触发器 DFF**

此触发器是用于模块屏幕显示开和关的控制。DFF=1 为开显示(DISPLAY OFF)，DDRAM 的内容就显示在屏幕上，DFF=0 为关显示 (DISPLAY OFF)。

DDF 的状态是指令 DISPLAY ON/OFF 和 RST 信号控制的。

**5．XY 地址计数器**

XY 地址计数器是一个 9 位计数器。高 3 位是 X 地址计数器，低 6 位为 Y 地址计数器，XY 地址计数器实际上是作为 DDRAM 的地址指针，X 地址计数器为 DDRAM 的页指针，Y 地址计数器为 DDRAM 的 Y 地址指针。

X 地址计数器是没有记数功能的，只能用指令设置。

Y 地址计数器具有循环记数功能，各显示数据写入后，Y 地址自动加 1，Y 地址指针从 0 到 63。

**6．显示数据 RAM（DDRAM）**

DDRAM 是存储图形显示数据的。数据为 1 表示显示选择，数据为 0 表示显示非选择。DDRAM 与地址和显示位置的关系见 DDRAM 地址表（见第 6 页）。

**7．Z 地址计数器**

Z 地址计数器是一个 6 位计数器，此计数器具备循环记数功能，它是用于显示行扫描同步。当一行扫描完成，此地址计数器自动加 1，指向下一行扫描数据，RST 复位后 Z 地址计数器为 0。

Z 地址计数器可以用指令 DISPLAY START LINE 预置。因此，显示屏幕的起始行就由此指令控制，即 DDRAM 的数据从哪一行开始显示在屏幕的第一行。此模块的 DDRAM 共 64 行，屏幕可以循环滚动显示 64 行。

## 四．模块的外部接口

| 管脚号 | 管脚名称 | LEVER | 管脚功能描述 |
|---|---|---|---|
| 1 | VSS | 0 | 电源地 |
| 2 | VDD | 5.0V | 电源电压 |
| 3 | V0 | 5.0V∽-10V | 加液晶显示器驱动负电压 |
| 4 | D/I | H/L | D/I=“H”，表示 DB7∽DB0 为显示数据<br>D/I=“L”，表示 DB7∽DB0 为显示指令数据 |
| 5 | R/W | H/L | R/W=“H”，E=“H”数据被读到 DB7∽DB0<br>R/W=“L”，E=“H→L”数据被写到 IR 或 DR |
| 6 | E | H/L | R/W=“L”，E 信号下降沿锁存 DB7∽DB0<br>R/W=“H”，E=“H”DDRAM 数据读到 DB7∽DB0 |
| 7 | DB0 | H/L | 数据线 |
| 8 | DB1 | H/L | 数据线 |
| 9 | DB2 | H/L | 数据线 |
| 10 | DB3 | H/L | 数据线 |
| 11 | DB4 | H/L | 数据线 |
| 12 | DB5 | H/L | 数据线 |
| 13 | DB6 | H/L | 数据线 |
| 14 | DB7 | H/L | 数据线 |
| 15 | CS1 | L | 选择 IC1，即（左）64 列 |
| 16 | RESET | L | 复位控制信号，RST=0 有效 |
| 17 | CS2 | L | 选择 IC2，即（中）64 列 |

| | | | |
|---|---|---|---|
| 18 | CS3 | L | 选择 IC3，即（右）64 列 |
| 19 | VEE | -10V | 输出负电压 |
| 20 | LED+ | +5.0V | LED 背光板电源 |

## 五．指令说明

指令表

表 3

| 指令 | 指令码 | | | | | | | | | | 功能 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | R/W | D/I | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | |
| 显示 ON/OFF | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1/0 | 控制显示器的开关，不影响 DDRAM 中数据和内部状态 |
| 显示起始行 | 0 | 0 | 1 | 1 | 显示起始行 (0‥‥63) | | | | | | 指定显示屏从 DDRAM 中哪一行开始显示数据 |
| 设置 X 地址 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | X：0‥‥7 | | | 设置 DDRAM 中的页地址(X 地址) |
| 设置 Y 地址 | 0 | 0 | 0 | 1 | Y 地址（0‥‥63） | | | | | | 设置地址(Y 地址) |
| 读状态 | 1 | 0 | BUSY | 0 | ON/OFF | RST | 0 | 0 | 0 | 0 | 读取状态<br>RST 1:复位 0:正常<br>ON/OFF 1:显示开 0:显示关<br>BUSY 0:READY 1:IN OPERATION |
| 写显示数据 | 0 | 1 | 显示数据 | | | | | | | | 将数据线上的数据 DB7∽DB0 写入 DDRAM |
| 读显示数据 | 1 | 1 | 显示数据 | | | | | | | | 将数据线上的数据 DB7∽DB0 写入 DDRAM |

### 1.显示开关控制(DISPLAY ON/OFF)

| 代码形式 | R/W | D/I | DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | D |

D=1:开显示(DISPLAY ON)意即显示器可以进行各种显示操作

D=0:关显示(DISPLAY OFF)意即不能对显示器可以进行各种显示操作

### 2.设置显示起始行

| 代码形式 | R/W | D/I | DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 0 | 1 | 1 | A5 | A4 | A3 | A2 | A1 | A0 |

前面在 Z 地址计数器一节已经描述了显示起始行是由 Z 地址计数器控制的。A5∽A0 的 6 位地址自动送入 Z 地址计数器,起始行的地址可以是 0∽ 63

的任意一行。

例如：

选择 A5∽A0 是 62，则起始行与 DDRAM 行的对应关系如下：

DDRAM　行：62 63 0 1 2 3……………………… 28 29

屏幕显示行：1　2　3 4 5 6…………………31 32

### 3.设置页地址

| 代码 | R/W | D/I | DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|---|---|---|---|---|---|---|---|---|---|---|
| 形式 | 0 | 0 | 1 | 0 | 1 | 1 | 1 | A2 | A1 | A0 |

所谓页地址就是 DDRAM 的行地址,8 行为一页,模块共 64 行即 8 页, A2∽A0 表示 0∽7 页。读写数据对地址没有影响，页地址由本指令或 RST 信号改变复位后页地址为 0。页地址与 DDRAM 的对应关系见 DDRAM 地址表。

### 4.设置 Y 地址(SET Y ADDRESS)

| 代码 | R/W | D/I | DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|---|---|---|---|---|---|---|---|---|---|---|
| 形式 | 0 | 0 | 0 | 1 | A5 | A4 | A3 | A2 | A1 | A0 |

此指令的作用是将 A5∽A0 送入 Y 地址计数器,作为 DDRAM 的 Y 地址指针。在对 DDRAM 进行读写操作后，Y 地址指针自动加 1，指向下一个 DDRAM 单元。

DDRAM 地址表：

表　4

| | CS1=1 | | | | | CS2=1 | | | | | CS3=1 | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y= | 0 | 1 | ·· | 62 | 63 | 0 | 1 | ·· | 62 | 63 | 0 | 1 | ·· | 62 | 63 | 行号 |
| X=0 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | 0<br>↓<br>7 |
| ↓ | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | 8<br>↓<br>55 |
| X=7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | DB0<br>↓<br>DB7 | 56<br>↓<br>63 |

### 5.读状态(STATUS READ)

| 代码 | R/W | D/I | DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|---|---|---|---|---|---|---|---|---|---|---|
| 形式 | 0 | 1 | BUSY | 0 | ON/<br>OFF | RET | 0 | 0 | 0 | 0 |

当 R/W=1 D/I=0 时，在 E 信号为“H”的作用下，状态分别输出到数据总线（DB7∽DB0）的相应位。

BF：前面已叙述过（见 BF 标志位一节）。

ON/OFF：表示 DFF 触发器的状态（见 DFF 触发器一节）。

RST：RST=1 表示内部正在初始化，此时组件不接受任何指令和数据。

### 6.写显示数据(WRITE DISPLAY DATE)

| 代码 | R/W | D/I | DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|---|---|---|---|---|---|---|---|---|---|---|
| 形式 | 0 | 1 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |

D7∽D0 为显示数据,此指令把 D7∽D0 写入相应的 DDRAM 单元,Y 地指针自动加 1。

7.读显示数据(READ DISPLAY DATE)

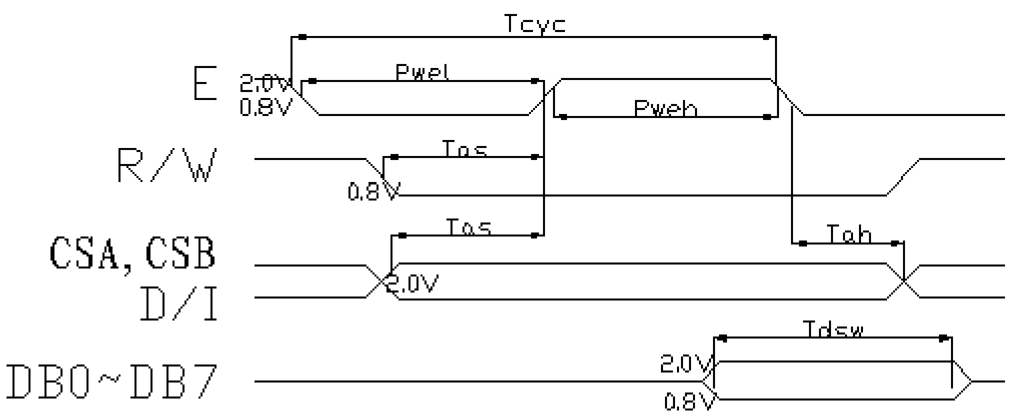
| 代码 | R/W | D/I | DB7 | DB6 | DB5 | DB4 | DB3 | DB2 | DB1 | DB0 |
|---|---|---|---|---|---|---|---|---|---|---|
| 形式 | 1 | 1 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |

此指令把 DDRAM 的内容 D7∽D0 读到数据总线 DB7∽DB0,Y 地址指针自动加 1。

## 六. 读写操作时序

### 1.写操作时序

图 3




### 2.读操作时序

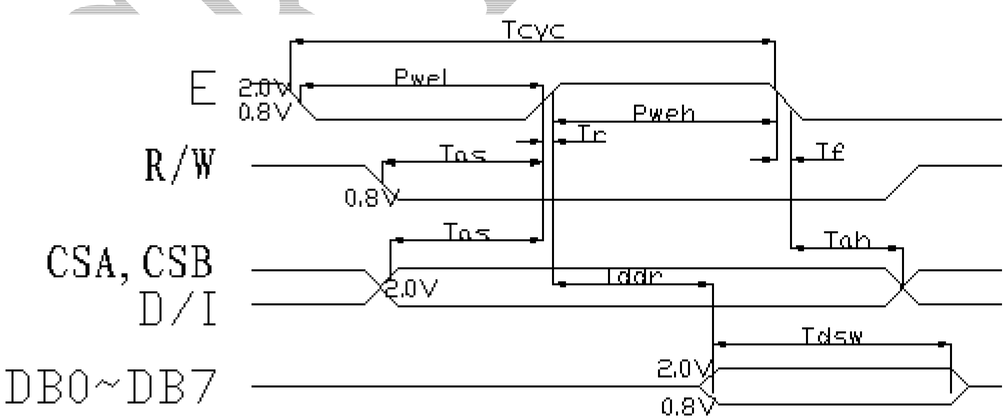



图 4

### 3.读写时序参数表

表 5

| 名　　称 | 符　号 | 最小值 | 典型值 | 最大值 | 单位 |
|---|---|---|---|---|---|
| E 周期时间 | Tcyc | 1000 | --- | --- | ns |

| | | | | | |
|---|---|---|---|---|---|
| E 高电平宽度 | Pweh | 450 | --- | --- | ns |
| E 低电平宽度 | Pwel | 450 | --- | --- | ns |
| E 上升时间 | Tr | --- | --- | 25 | ns |
| E 下降时间 | Tf | --- | --- | 25 | ns |
| 地址建立时间 | Tas | 140 | --- | --- | ns |
| 地址保持时间 | Tah | 10 | --- | --- | ns |
| 数据建立时间 | Tdsw | 200 | --- | --- | ns |
| 数据延迟时间 | Tddr | --- | --- | 320 | ns |
| 写数据保持时间 | Tdhw | 10 | --- | --- | ns |
| 读数据保持时间 | Tdhw | 20 | --- | --- | ns |

## 七．应用举例

CM19264-1 与单片机 8031 的一种接口如图 5.所示：

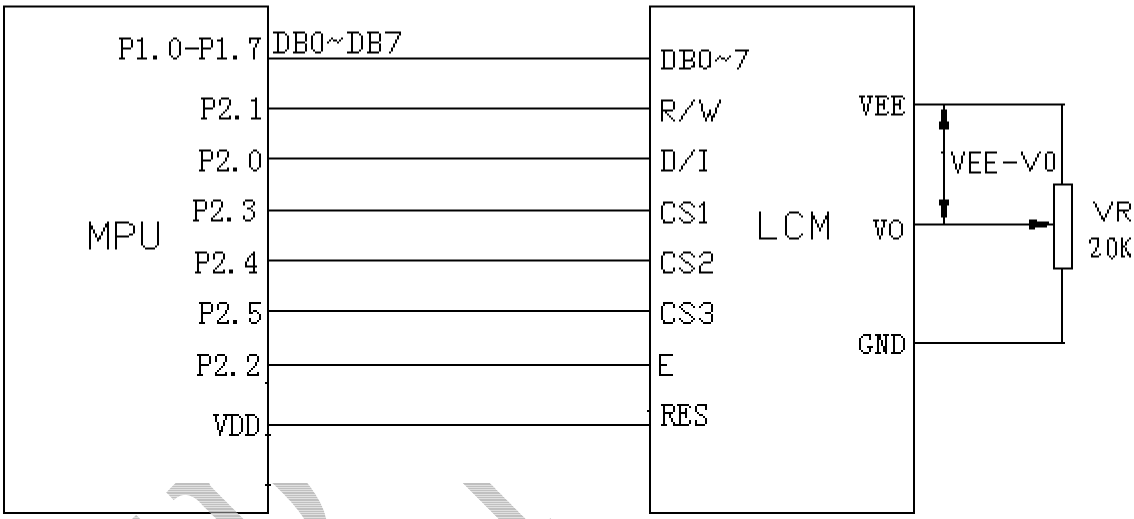



图 5

```
         ORG      0000H
           LJMP       MAIN
           ORG      0003H
           LJMP     ZHONGDUAN
           ORG      0035H
ZHONGDUAN:
           LCALL    DELAY
           CLR      EA
           JB       P3.2,$
           SETB     EA
           LCALL    DELAY
           RETI
```

```
   CS1      EQU      P2.3
   CS2      EQU      P2.4
   CS3      EQU      P2.5
   DI       EQU      P2.0
   RW       EQU      P2.1
   E        EQU      P2.2
   DATA1    EQU      50H
   DATA2    EQU      51H
   DATA3    EQU      52H
 ;***********写左半屏命令********************
WRITE_COMMAND_L:
   CLR   CS1
   CLR    RW
   CLR    DI
   MOV    P1,DATA1
   SETB   E
   CLR    E
   SETB    CS1
   RET

 ;***********写左半屏数据*******************
WRITE_DATA_L:
   CLR   CS1
   CLR    RW
   SETB   DI
   MOV    P1,DATA2
   SETB   E
   CLR    E
   SETB    CS1
   RET
 ;***********写右半屏命令********************
WRITE_COMMAND_R:
   CLR   CS2
   CLR    RW
   CLR    DI
   MOV    P1,DATA1
   SETB   E
   CLR    E
   SETB    CS2
   RET
```

```
 ;***********写右半屏数据********************
WRITE_DATA_R:
   CLR   CS2
   CLR    RW
   SETB   DI
   MOV    P1,DATA2
   SETB   E
   CLR    E
   SETB    CS2
   RET
  ;***********写中间半屏命令********************
WRITE_COMMAND_M:
   CLR   CS3
   CLR    RW
   CLR    DI
   MOV    P1,DATA1
   SETB   E
   CLR    E
   SETB    CS3
   RET

 ;***********写中间半屏数据********************
WRITE_DATA_M:
   CLR   CS3
   CLR    RW
   SETB   DI
   MOV    P1,DATA2
   SETB   E
   CLR    E
   SETB    CS3
   RET
 ;**********延时程序*******************
    MS40:     MOV      R7,#0E8H
    MS2:      MOV      R6,#0FFH
    MS1:      DJNZ     R6,MS1
              DJNZ     R7,MS2
              RET
    DELAY:    MOV      R5,#07H
    DELAY1:   LCALL     MS40
              DJNZ     R5,DELAY1
              RET
 ;*************************************
```

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```
MAIN:
        MOV      P2,#0FFH
        MOV      SP,#60H
        SETB    EA
        SETB    EX0
        SETB    IT0

        MOV      DATA1,#3EH
        LCALL    WRITE_COMMAND_L
        LCALL    WRITE_COMMAND_R
        LCALL    WRITE_COMMAND_M
        MOV      DATA1,#3FH
        LCALL    WRITE_COMMAND_L
        LCALL    WRITE_COMMAND_R
        LCALL    WRITE_COMMAND_M
        MOV      DATA1,#0C0H
        LCALL    WRITE_COMMAND_L
        LCALL    WRITE_COMMAND_R
        LCALL    WRITE_COMMAND_M
        MOV      DATA1,#0B8H     ;PAGE ADDRESS
        LCALL    WRITE_COMMAND_L
        LCALL    WRITE_COMMAND_R
        LCALL    WRITE_COMMAND_M
        MOV      DATA1,#40H      ;Y    ADDRESS
        LCALL    WRITE_COMMAND_L
        LCALL    WRITE_COMMAND_R
        LCALL    WRITE_COMMAND_M
        MOV      R1,#8
        MOV      DATA3,#0B8H
        MOV      DATA1,DATA3
  M21:  MOV      DATA1,DATA3
        LCALL    WRITE_COMMAND_L
        LCALL    WRITE_COMMAND_R
        LCALL    WRITE_COMMAND_M
        MOV      DATA1,#40H
        LCALL    WRITE_COMMAND_L
        LCALL    WRITE_COMMAND_R
        LCALL    WRITE_COMMAND_M
        MOV      R2,#64
```

```
L21:  MOV       DATA2,#0AAH
      LCALL     WRITE_DATA_L
      LCALL     WRITE_DATA_R
       LCALL     WRITE_DATA_M
      DJNZ      R2,L21
      INC       DATA3
      DJNZ      R1,M21
      LCALL     DELAY

      MOV       R1,#8
      MOV       DATA3,#0B8H
      MOV       DATA1,DATA3
M22:  MOV       DATA1,DATA3
      LCALL     WRITE_COMMAND_L
      LCALL     WRITE_COMMAND_R
      LCALL     WRITE_COMMAND_M
      MOV       DATA1,#40H
      LCALL     WRITE_COMMAND_L
      LCALL     WRITE_COMMAND_R
      LCALL     WRITE_COMMAND_M
      MOV       R2,#64
L22:  MOV       DATA2,#55H
      LCALL     WRITE_DATA_L
      LCALL     WRITE_DATA_R
      LCALL     WRITE_DATA_M
      DJNZ      R2,L22
      INC       DATA3
      DJNZ      R1,M22
      LCALL     DELAY

      MOV       R1,#8
      MOV       DATA3,#0B8H
      MOV       DATA1,DATA3
M23:  MOV       DATA1,DATA3
      LCALL     WRITE_COMMAND_L
      LCALL     WRITE_COMMAND_R
       LCALL     WRITE_COMMAND_M
      MOV       DATA1,#40H
      LCALL     WRITE_COMMAND_L
      LCALL     WRITE_COMMAND_R
       LCALL     WRITE_COMMAND_M
      MOV       R2,#32
```

```
L23:  MOV       DATA2,#0FFH
      LCALL     WRITE_DATA_L
      LCALL     WRITE_DATA_R
       LCALL     WRITE_DATA_M
      MOV       DATA2,#00H
      LCALL     WRITE_DATA_L
      LCALL     WRITE_DATA_R
       LCALL     WRITE_DATA_M
      DJNZ      R2,L23
      INC       DATA3
      DJNZ      R1,M23
      LCALL     DELAY

      MOV       R1,#8
      MOV       DATA3,#0B8H
      MOV       DATA1,DATA3
M24:  MOV       DATA1,DATA3
      LCALL     WRITE_COMMAND_L
      LCALL     WRITE_COMMAND_R
      LCALL     WRITE_COMMAND_M
      MOV       DATA1,#40H
      LCALL     WRITE_COMMAND_L
      LCALL     WRITE_COMMAND_R
      LCALL     WRITE_COMMAND_M
      MOV       R2,#32
L24:  MOV       DATA2,#00H
      LCALL     WRITE_DATA_L
      LCALL     WRITE_DATA_R
       LCALL     WRITE_DATA_M
      MOV       DATA2,#0FFH
      LCALL     WRITE_DATA_L
      LCALL     WRITE_DATA_R
       LCALL     WRITE_DATA_M
      DJNZ      R2,L24
      INC       DATA3
      DJNZ      R1,M24
      LCALL     DELAY

      MOV       R1,#8
      MOV       DATA3,#0B8H
      MOV       DATA1,DATA3
M25:  MOV       DATA1,DATA3
```

```
        LCALL   WRITE_COMMAND_L
        LCALL   WRITE_COMMAND_R
        LCALL   WRITE_COMMAND_M
        MOV     DATA1,#40H
        LCALL   WRITE_COMMAND_L
        LCALL   WRITE_COMMAND_R
        LCALL   WRITE_COMMAND_M
        MOV     R2,#32
L25:    MOV     DATA2,#0AAH
        LCALL   WRITE_DATA_L
        LCALL   WRITE_DATA_R
         LCALL   WRITE_DATA_M
        MOV     DATA2,#55H
        LCALL   WRITE_DATA_L
        LCALL   WRITE_DATA_R
         LCALL   WRITE_DATA_M
        DJNZ    R2,L25
        INC     DATA3
        DJNZ    R1,M25
        LCALL   DELAY

        MOV     R1,#8
        MOV     DATA3,#0B8H
        MOV     DATA1,DATA3
M26:    MOV     DATA1,DATA3
        LCALL   WRITE_COMMAND_L
        LCALL   WRITE_COMMAND_R
        LCALL   WRITE_COMMAND_M
        MOV     DATA1,#40H
        LCALL   WRITE_COMMAND_L
        LCALL   WRITE_COMMAND_R
        LCALL   WRITE_COMMAND_M
        MOV     R2,#32
L26:    MOV     DATA2,#55H
        LCALL   WRITE_DATA_L
        LCALL   WRITE_DATA_R
         LCALL   WRITE_DATA_M
        MOV     DATA2,#0AAH
        LCALL   WRITE_DATA_L
        LCALL   WRITE_DATA_R
         LCALL   WRITE_DATA_M
        DJNZ    R2,L26
```

```
        INC     DATA3
        DJNZ    R1,M26
        LCALL   DELAY

        MOV     DPTR,#CHINESE1
        MOV     R1,#8
        MOV     DATA3,#0B8H
        MOV     DATA1,DATA3
M27:    MOV     DATA1,DATA3
        LCALL   WRITE_COMMAND_L
        MOV     DATA1,#40H
        LCALL   WRITE_COMMAND_L
        MOV     R2,#64
L27:
        CLR     A
        MOVC    A,@A+DPTR
        MOV     DATA2,A
        LCALL   WRITE_DATA_L
        INC     DPTR
        DJNZ    R2,L27
        INC     DATA3
        DJNZ    R1,M27

        MOV     DPTR,#CHINESE2
        MOV     R1,#8
        MOV     DATA3,#0B8H
        MOV     DATA1,DATA3
M28:    MOV     DATA1,DATA3
        LCALL   WRITE_COMMAND_R
        MOV     DATA1,#40H
        LCALL   WRITE_COMMAND_R
        MOV     R2,#64
L28:
        CLR     A
        MOVC    A,@A+DPTR
        MOV     DATA2,A
        LCALL   WRITE_DATA_R
        INC     DPTR
        DJNZ    R2,L28
        INC     DATA3
        DJNZ    R1,M28
```

```
         MOV       DPTR,#CHINESE3
        MOV       R1,#8
        MOV       DATA3,#0B8H
        MOV       DATA1,DATA3
  M29:  MOV       DATA1,DATA3
        LCALL     WRITE_COMMAND_M
        MOV       DATA1,#40H
        LCALL     WRITE_COMMAND_M
        MOV       R2,#64
  L29:
        CLR       A
        MOVC      A,@A+DPTR
        MOV       DATA2,A
        LCALL     WRITE_DATA_M
        INC       DPTR
        DJNZ      R2,L29
        INC       DATA3
        DJNZ      R1,M29
        LCALL     DELAY

        LJMP      MAIN

  CHINESE1:
DB
0FFH,0FFH,003H,023H,0A3H,023H,063H,0B3H,013H,013H,0D3H,083H,003H,003H,083H,063H
DB
043H,003H,003H,003H,003H,003H,0E3H,0A3H,0A3H,0A3H,0A3H,0A3H,0A3H,0E3H,003H,003H
DB
003H,003H,003H,023H,023H,023H,0E3H,013H,013H,003H,023H,0C3H,003H,003H,0F3H,003H
DB
003H,003H,083H,083H,083H,0F3H,083H,083H,003H,083H,083H,083H,0F3H,083H,083H,083H
DB
0FFH,0FFH,000H,008H,008H,08BH,068H,0FDH,02AH,049H,088H,088H,002H,021H,010H,088H
DB
076H,024H,000H,0F0H,050H,050H,057H,052H,0F2H,002H,002H,0F2H,052H,057H,050H,050H
DB
0F0H,000H,041H,021H,019H,007H,0FFH,005H,049H,040H,042H,02CH,020H,020H,0FFH,010H
DB
010H,000H,010H,010H,008H,0FFH,004H,002H,000H,00CH,034H,0C4H,0C7H,024H,01CH,004H
DB
0FFH,0FFH,000H,002H,001H,000H,000H,08FH,080H,080H,085H,004H,002H,002H,001H,000H
```

```
DB
000H,000H,000H,007H,002H,002H,002H,002H,007H,000H,000H,007H,002H,002H,002H,002H
DB
007H,000H,000H,000H,000H,000H,00FH,080H,080H,000H,000H,000H,000H,000H,08FH,000H
DB
000H,000H,000H,004H,008H,087H,000H,004H,004H,002H,001H,000H,080H,001H,002H,006H
DB
0FFH,0FFH,000H,041H,045H,059H,043H,0EDH,050H,048H,046H,044H,010H,008H,084H,043H
DB
0B2H,020H,000H,080H,080H,080H,0BFH,095H,095H,015H,015H,095H,095H,0BFH,080H,080H
DB
080H,000H,008H,009H,0C9H,039H,0FFH,028H,048H,000H,011H,066H,000H,000H,0FFH,080H
DB
080H,000H,084H,084H,044H,0FFH,024H,014H,000H,064H,0A4H,024H,03FH,024H,0E4H,024H
DB
0FFH,0FFH,000H,010H,008H,004H,003H,07FH,001H,002H,02CH,024H,010H,011H,008H,004H
DB
003H,001H,000H,03FH,012H,012H,012H,012H,03FH,000H,000H,03FH,012H,012H,012H,012H
DB
03FH,000H,002H,001H,000H,000H,07FH,000H,002H,002H,002H,001H,001H,001H,07FH,000H
DB
000H,000H,000H,020H,040H,03FH,000H,020H,020H,010H,009H,006H,006H,009H,010H,030H
DB
0FFH,0FFH,000H,010H,050H,090H,030H,0D8H,008H,088H,068H,040H,000H,080H,040H,030H
DB
020H,000H,000H,000H,000H,000H,0F0H,050H,050H,050H,050H,050H,050H,0F0H,000H,000H
DB
000H,000H,080H,090H,090H,090H,0F0H,088H,088H,000H,010H,060H,000H,000H,0F8H,000H
DB
000H,000H,040H,040H,040H,0F8H,040H,040H,000H,040H,040H,040H,0F8H,040H,040H,040H
DB
0FFH,0FFH,000H,004H,084H,045H,034H,0FEH,015H,024H,0C4H,044H,001H,010H,088H,044H
DB
03BH,012H,000H,0F8H,028H,028H,02BH,029H,0F9H,001H,001H,0F9H,029H,02BH,028H,028H
DB
0F8H,000H,020H,010H,00CH,003H,0FFH,002H,024H,020H,021H,016H,010H,010H,0FFH,008H
DB
008H,000H,008H,008H,004H,0FFH,002H,001H,000H,006H,09AH,062H,063H,092H,00EH,002H
DB
0FFH,0FFH,0C0H,0C1H,0C0H,0C0H,0C0H,0C7H,0C0H,0C0H,0C2H,0C2H,0C1H,0C1H,0C0H,0C0H
DB
0C0H,0C0H,0C0H,0C3H,0C1H,0C1H,0C1H,0C1H,0C3H,0C0H,0C0H,0C3H,0C1H,0C1H,0C1H,0C1H
```

```
DB
0C3H,0C0H,0C0H,0C0H,0C0H,0C0H,0C7H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C7H,0C0H
DB
0C0H,0C0H,0C0H,0C2H,0C4H,0C3H,0C0H,0C2H,0C2H,0C1H,0C0H,0C0H,0C0H,0C0H,0C1H,0C3H

CHINESE3:
DB
003H,013H,063H,003H,083H,043H,043H,0C3H,043H,053H,0E3H,043H,043H,043H,043H,003H
DB
003H,003H,003H,0E3H,0A3H,0A3H,0A3H,0A3H,0A3H,0A3H,0E3H,003H,003H,003H,003H,003H
DB
003H,003H,0E3H,0A3H,0A3H,0A3H,0A3H,0A3H,0A3H,0A3H,0E3H,003H,003H,003H,003H,003H
DB
003H,023H,023H,023H,023H,023H,023H,023H,023H,023H,023H,003H,003H,003H,0FFH,0FFH
DB
041H,046H,0F0H,00EH,011H,008H,0FEH,011H,018H,026H,0CBH,0B2H,01AH,006H,000H,000H
DB
0F0H,050H,050H,057H,052H,0F2H,002H,002H,0F2H,052H,057H,050H,050H,0F0H,000H,000H
DB
010H,020H,0C3H,002H,0FEH,002H,002H,002H,0FEH,082H,043H,030H,000H,000H,000H,082H
DB
042H,032H,002H,002H,002H,0FEH,002H,002H,012H,022H,0C2H,082H,002H,000H,0FFH,0FFH
DB
000H,080H,00FH,000H,000H,000H,00FH,004H,002H,081H,000H,001H,006H,00CH,004H,000H
DB
007H,002H,002H,002H,002H,007H,000H,000H,007H,002H,002H,002H,002H,007H,000H,002H
DB
002H,002H,002H,002H,003H,002H,002H,002H,003H,002H,002H,002H,002H,002H,001H,000H
DB
000H,000H,000H,004H,008H,007H,000H,000H,000H,000H,000H,001H,000H,000H,0FFH,0FFH
DB
008H,030H,083H,070H,08CH,042H,0F2H,08EH,0C2H,032H,05FH,092H,0D2H,032H,002H,000H
DB
080H,080H,080H,0BFH,095H,095H,015H,015H,095H,095H,0BFH,080H,080H,080H,000H,000H
DB
080H,000H,01FH,015H,0F5H,015H,015H,015H,0F5H,015H,01FH,080H,000H,000H,000H,010H
DB
010H,091H,011H,011H,011H,0F1H,011H,011H,091H,011H,011H,010H,010H,000H,0FFH,0FFH
DB
002H,002H,07FH,000H,000H,000H,07FH,020H,010H,009H,006H,00DH,030H,060H,020H,000H
DB
03FH,012H,012H,012H,012H,03FH,000H,000H,03FH,012H,012H,012H,012H,03FH,000H,010H
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DB
010H,011H,016H,010H,01FH,010H,010H,010H,01FH,014H,012H,011H,010H,010H,008H,004H
DB
002H,001H,000H,020H,040H,03FH,000H,000H,000H,001H,006H,00CH,000H,000H,0FFH,0FFH
DB
080H,008H,030H,000H,0C0H,020H,020H,0E0H,020H,028H,0F0H,020H,020H,020H,020H,000H
DB
000H,000H,000H,0F0H,050H,050H,050H,050H,050H,050H,0F0H,000H,000H,000H,000H,000H
DB
000H,000H,0F0H,050H,050H,050H,050H,050H,050H,050H,0F0H,000H,000H,000H,000H,000H
DB
000H,010H,010H,010H,010H,010H,010H,010H,010H,010H,010H,000H,000H,000H,0FFH,0FFH
DB
020H,023H,0F8H,007H,008H,004H,0FFH,008H,00CH,093H,065H,0D9H,00DH,003H,000H,000H
DB
0F8H,028H,028H,02BH,029H,0F9H,001H,001H,0F9H,029H,02BH,028H,028H,0F8H,000H,000H
DB
008H,010H,061H,001H,0FFH,001H,001H,001H,0FFH,041H,021H,018H,000H,000H,080H,041H
DB
021H,019H,001H,001H,001H,0FFH,001H,001H,009H,011H,061H,0C1H,001H,000H,0FFH,0FFH
DB
0C0H,0C0H,0C7H,0C0H,0C0H,0C0H,0C7H,0C2H,0C1H,0C0H,0C0H,0C0H,0C3H,0C6H,0C2H,0C0H
DB
0C3H,0C1H,0C1H,0C1H,0C1H,0C3H,0C0H,0C0H,0C3H,0C1H,0C1H,0C1H,0C1H,0C3H,0C0H,0C1H
DB
0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C1H,0C0H,0C0H
DB
0C0H,0C0H,0C0H,0C2H,0C4H,0C3H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0FFH,0FFH

CHINESE2:
DB
083H,003H,003H,043H,043H,043H,043H,043H,0C3H,073H,043H,043H,043H,043H,043H,043H
DB
043H,003H,0E3H,023H,023H,0E3H,023H,003H,0E3H,0A3H,0A3H,0A3H,0A3H,0A3H,0E3H,003H
DB
003H,003H,003H,003H,003H,003H,0E3H,043H,003H,003H,0E3H,003H,003H,003H,003H,003H
DB
003H,003H,023H,023H,023H,023H,023H,023H,023H,023H,023H,023H,023H,0E3H,003H,003H
DB
000H,000H,020H,010H,008H,004H,0FEH,093H,092H,092H,092H,092H,092H,0FEH,000H,000H
DB
000H,000H,0FFH,000H,023H,044H,038H,000H,0FFH,004H,00CH,034H,0C4H,024H,017H,000H
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DB
000H,000H,010H,008H,004H,083H,040H,038H,010H,000H,000H,041H,086H,00CH,018H,008H
DB
000H,001H,0F9H,049H,049H,049H,049H,049H,049H,0F9H,001H,000H,000H,0FFH,000H,000H
DB
002H,000H,000H,000H,000H,000H,00FH,000H,000H,080H,002H,004H,00CH,007H,000H,000H
DB
000H,000H,00FH,000H,000H,000H,000H,000H,00FH,004H,002H,000H,000H,001H,002H,006H
DB
002H,000H,000H,002H,007H,002H,002H,002H,003H,001H,001H,001H,007H,003H,000H,000H
DB
000H,000H,001H,000H,000H,000H,000H,000H,000H,000H,000H,002H,004H,003H,000H,000H
DB
004H,000H,000H,082H,042H,022H,0F2H,09AH,096H,093H,092H,092H,092H,0F2H,002H,002H
DB
002H,000H,0FFH,001H,019H,027H,0C1H,000H,0FFH,025H,065H,0A5H,025H,025H,0BFH,000H
DB
000H,000H,080H,040H,020H,018H,007H,0C2H,080H,000H,007H,008H,030H,060H,0C0H,040H
DB
000H,008H,0C9H,049H,049H,049H,049H,049H,049H,0C9H,009H,001H,001H,0FFH,000H,000H
DB
010H,000H,001H,000H,000H,000H,07FH,004H,004H,004H,014H,024H,064H,03FH,000H,000H
DB
000H,000H,07FH,000H,001H,002H,001H,000H,07FH,020H,010H,001H,006H,009H,010H,030H
DB
010H,000H,000H,010H,038H,014H,012H,011H,018H,008H,008H,00AH,03CH,018H,000H,000H
DB
000H,000H,00FH,002H,002H,002H,002H,002H,002H,007H,000H,010H,020H,01FH,000H,000H
DB
040H,000H,000H,020H,020H,020H,020H,0A0H,060H,038H,020H,020H,020H,020H,020H,020H
DB
020H,000H,0F0H,010H,090H,070H,010H,000H,0F0H,050H,050H,050H,050H,050H,0F0H,000H
DB
000H,000H,000H,000H,000H,080H,070H,020H,000H,000H,070H,080H,000H,000H,000H,000H
DB
000H,080H,090H,090H,090H,090H,090H,090H,090H,090H,090H,010H,010H,0F0H,000H,000H
DB
000H,000H,010H,008H,004H,002H,0FFH,049H,049H,049H,049H,049H,049H,0FFH,000H,000H
DB
000H,000H,0FFH,000H,011H,022H,01CH,000H,0FFH,002H,006H,01AH,062H,092H,00BH,000H
DB
000H,000H,008H,004H,082H,041H,020H,01CH,088H,080H,080H,0A0H,0C3H,086H,00CH,004H
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```
DB
000H,000H,0FCH,024H,024H,024H,024H,024H,024H,07CH,000H,000H,000H,0FFH,000H,000H
DB
0C1H,0C0H,0C0H,0C0H,0C0H,0C0H,0C7H,0C0H,0C0H,0C0H,0C1H,0C2H,0C6H,0C3H,0C0H,0C0H
DB
0C0H,0C0H,0C7H,0C0H,0C0H,0C0H,0C0H,0C0H,0C7H,0C2H,0C1H,0C0H,0C0H,0C0H,0C1H,0C3H
DB
0C1H,0C0H,0C0H,0C1H,0C3H,0C1H,0C1H,0C1H,0C1H,0C0H,0C0H,0C0H,0C3H,0C1H,0C0H,0C0H
DB
0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C0H,0C1H,0C2H,0C1H,0C0H,0C0H

        END
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